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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/731,431

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EXAMINER

CAZAN, LIVIUS RADU

ART UNIT

PAPER NUMBER

3729

MAIL DATE

DELIVERY MODE

06/06/2008

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/731,431	Applicant(s) KURATA ET AL.	
	Examiner LIVIOUS R. CAZAN	Art Unit 3729	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 19 February 2008.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,4 and 6-10 is/are pending in the application.
- 4a) Of the above claim(s) 7-9 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,4,6 and 10 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

1. The amendment filed on 2/19/2008 has been fully considered and made of record.

Claim Rejections - 35 USC § 103

2. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

3. **Claims 1, 6, and 10** are rejected under 35 U.S.C. 103(a) as being unpatentable over Kano (US5539977) in view of Yoriki (US6640431) and Suhara (US7043824).

As discussed in the Office Actions mailed on 3/23/2007 and 10/16/2007, Kano discloses substantially the same invention as the Applicant, including a component feeding unit (7, Fig. 2), a suction nozzle (14, Fig. 4), and a line sensor sensing a vertical position of the lower end of the nozzle (27, Fig. 4; see col. 5, lns. 59-64). Kano also discloses determining a range of vertical movement of the suction nozzle based on the vertical position of the lower end of the suction nozzle measured by the position sensor (see ln. 65 of col. 7 to ln. 3 of col. 8).

However, the line sensor of Kano is located such that the sensing operation takes place after picking up a component, not before the nozzle performs a vertical movement for picking up a component.

Suhara discloses imaging the end of a suction nozzle to detect wear and adjusting the vertical movement stroke of the nozzle to compensate for the wear of the sucking end face so as to reduce the amount of impact between the nozzle and the

component at the component supply (pickup) position (see col. 37, lns 33-65). However, the nozzle is imaged after a component pickup, before mounting the component.

Yoriki discloses a component mounting apparatus whereby a line sensor images a nozzle for the purpose of detecting a faulty nozzle such as a bent or missing nozzle (see ln. 50 of col. 37 to ln. 56 of col. 38). This operation is performed either before or after a vertical movement for mounting or picking up a component (see ln. 60 of col. 29 to ln. 4 of col. 30).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the invention of Kano, in view of the teachings of Yoriki and Suhara to obtain a component mounting apparatus utilizing a line sensor to measure a vertical position of a nozzle as claimed, this measuring being performed at least after mounting a component but prior to picking up a next component, if not also before a vertical movement for mounting a component. One of ordinary skill in the art would have been motivated to do so because problems with a suction nozzle can appear at any point during the mounting cycle, not necessarily only after picking up a component but prior to placing the component on a substrate, and thus it would be obvious to add sensors that can detect a faulty or worn nozzle at other times as well, such as after mounting a component but prior to picking up the next component.

4. **Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kano, Yoriki, and Suhara in view of Takeuchi (US5661239).**

Kano, Yoriki, and Suhara disclose the same invention as the Applicant, except for a decision device judging that the suction nozzle is about to fall when the vertical

position of the lower end of the suction nozzle measured by the position sensor is lower than a predetermined position.

Takeuchi teaches a judging device (see col. 7, Ins. 55-60; clearly a decision device exists, since the apparatus is stopped due to the detection of a low nozzle) which judges that a suction nozzle is about to fall when the vertical position of the lower end of the suction nozzle is lower than a predetermined position. Takeuchi also teaches an optical sensor could be utilized (see col. 8, Ins. 10-20).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the invention of Kano, Yoriki, and Suhara, in view of the teachings of Takeuchi, providing it with a judging device which utilizes the output of the position sensor to judge a suction nozzle is about to fall if its lower end is lower than a predetermined position. One of ordinary skill in the art would have been motivated to do so since the sensor of Kano, Yoriki, and Suhara already tracks the lower end of the nozzle and therefore no new sensors would be required. A system thus implemented would allow the apparatus to detect a nozzle that is about to fall, in order to prevent improper operation.

Response to Arguments

5. Applicant's arguments with respect to the claims have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

6. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP

§ 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to LIVIUS R. CAZAN whose telephone number is (571)272-8032. The examiner can normally be reached on M-T 6:30AM-5:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Peter Vo can be reached on (571)272-4690. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Art Unit: 3729

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/A. Dexter Tugbang/
Primary Examiner
Art Unit 3729

/L. R. C./ 6/4/2008
Examiner, Art Unit 3729